

# Current Status of High Resolution MOS Guidance

**J. Paul Dallavalle/MDL**  
**ISST Briefing**  
**November 16, 2004**

# Objectives of Gridded MOS

- Produce MOS guidance on a high-resolution grid (2.5 to 5 km spacing)
- Generate guidance with detail sufficient for forecast initialization at local NWS Forecast Offices
- Generate guidance with a level of accuracy comparable to that of the station-oriented guidance

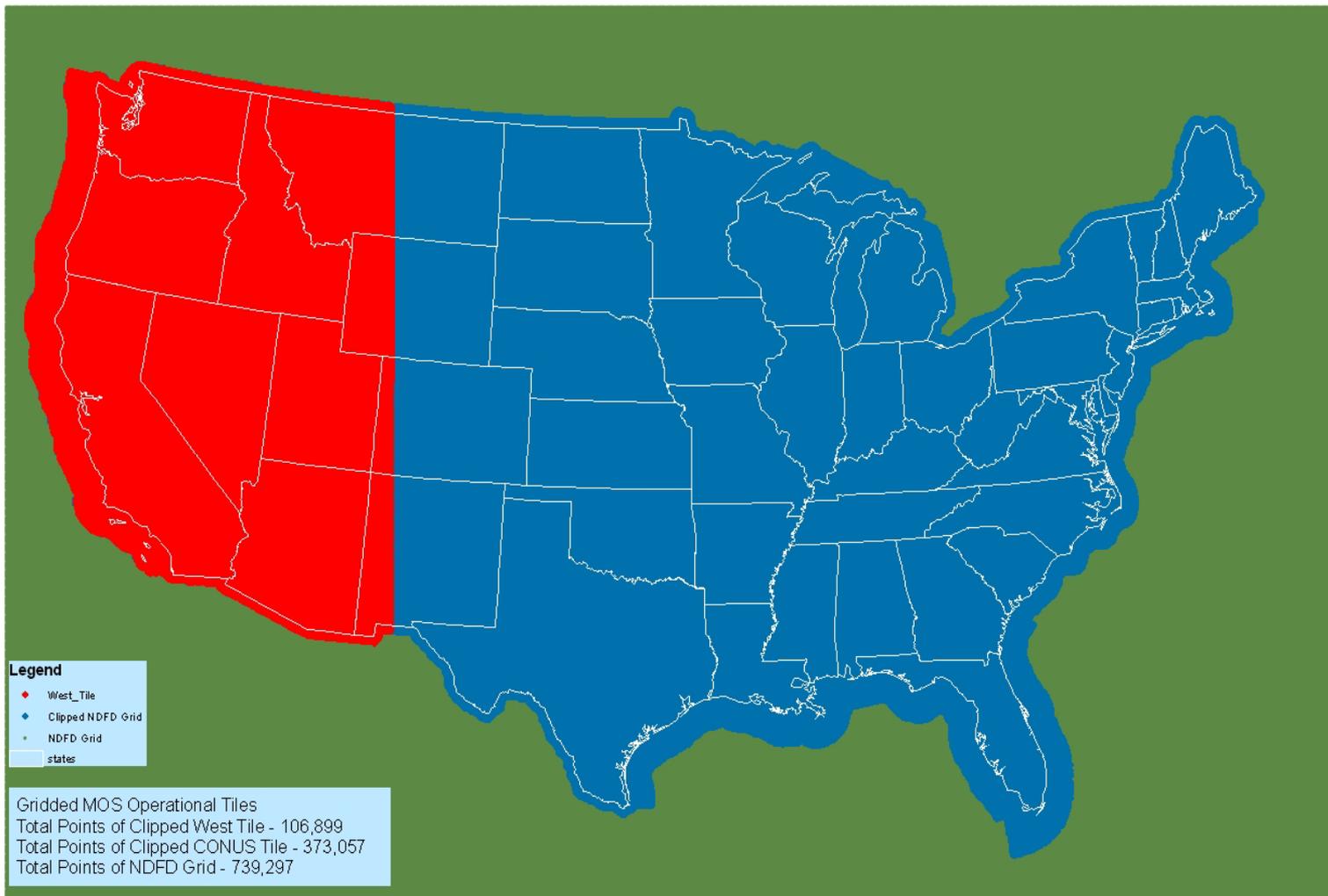
# Approach to Gridded MOS

- **Use high-resolution geoclimatic variables such as terrain, slope, aspect, land use, normals, etc.**
- **Use observations from remote-sensing networks such as lightning, precipitation amounts, satellite clouds**
- **Use mesonet surface observations**
- **Develop single-station and regionalized MOS equations as appropriate**
- **Apply regionalized equations to high-resolution grid**
- **Blend single-station and regional guidance**

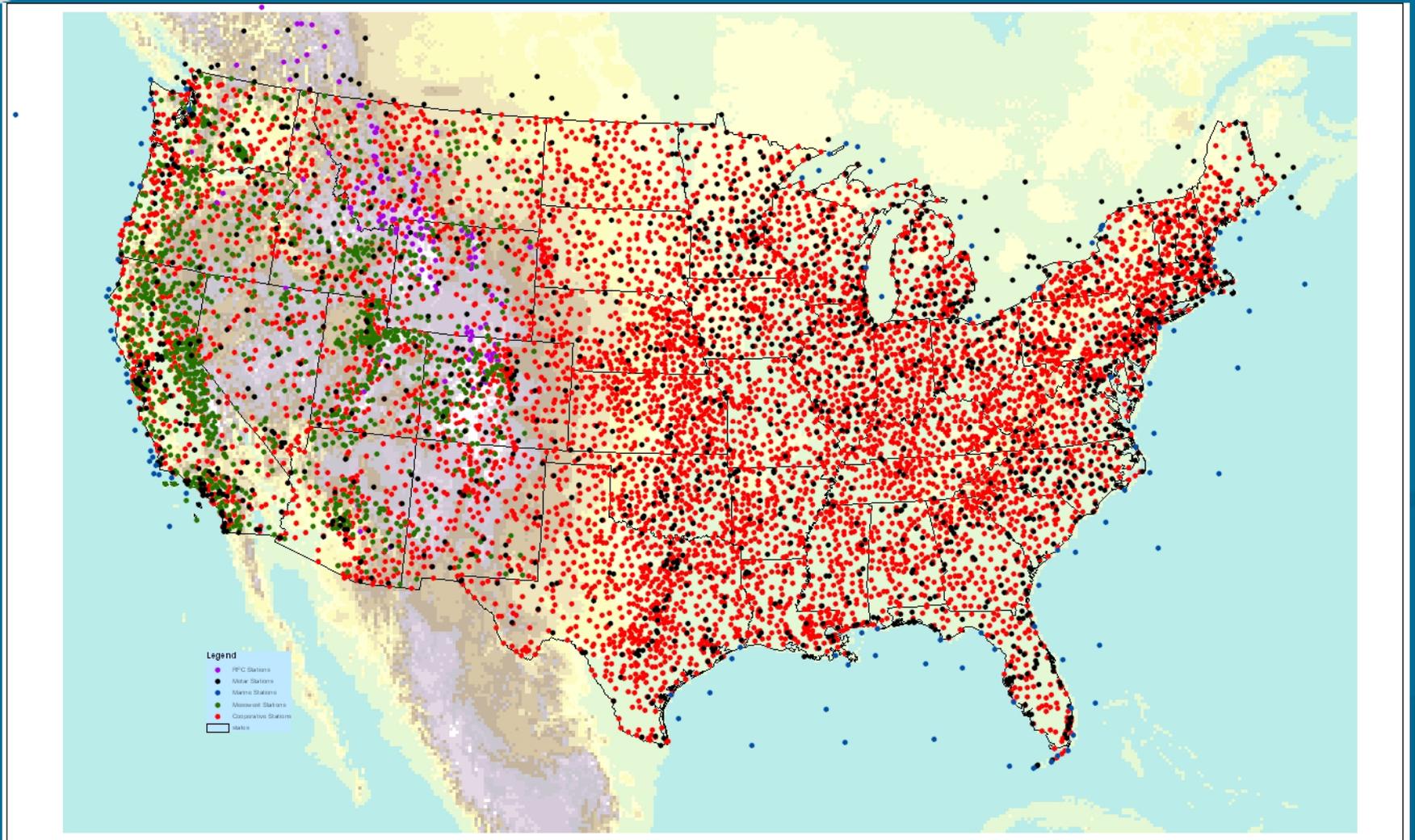
# Prototype Gridded MOS

- **GFS-based; 0000/1200 UTC cycles only**
- **Selected Elements**
  - *Max/min temperature, 2-m temperature & dewpoint*
  - *Probability of precipitation*
  - *Wind direction and speed*
  - *Probability of thunderstorms*
  - *Categorical 24-h snowfall amount*
- **Restricted area for initial implementation**
- **Scheduled initially for fall 2004**

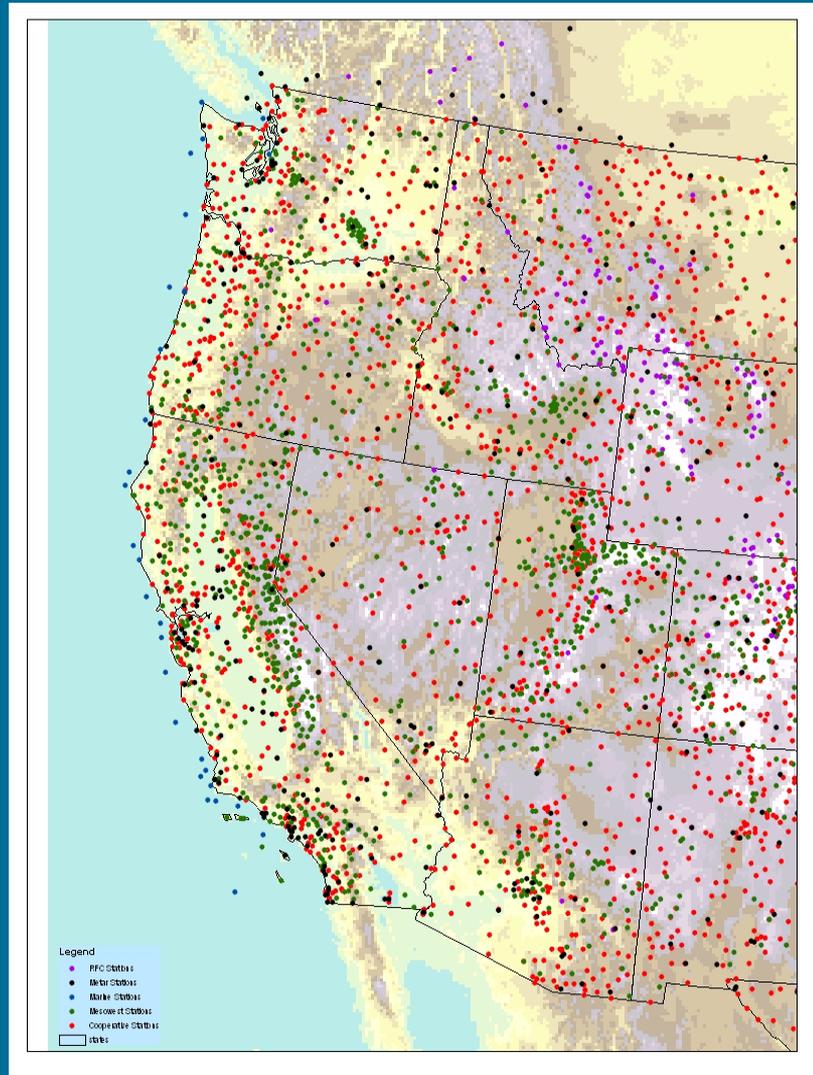
# Gridded MOS - CONUS



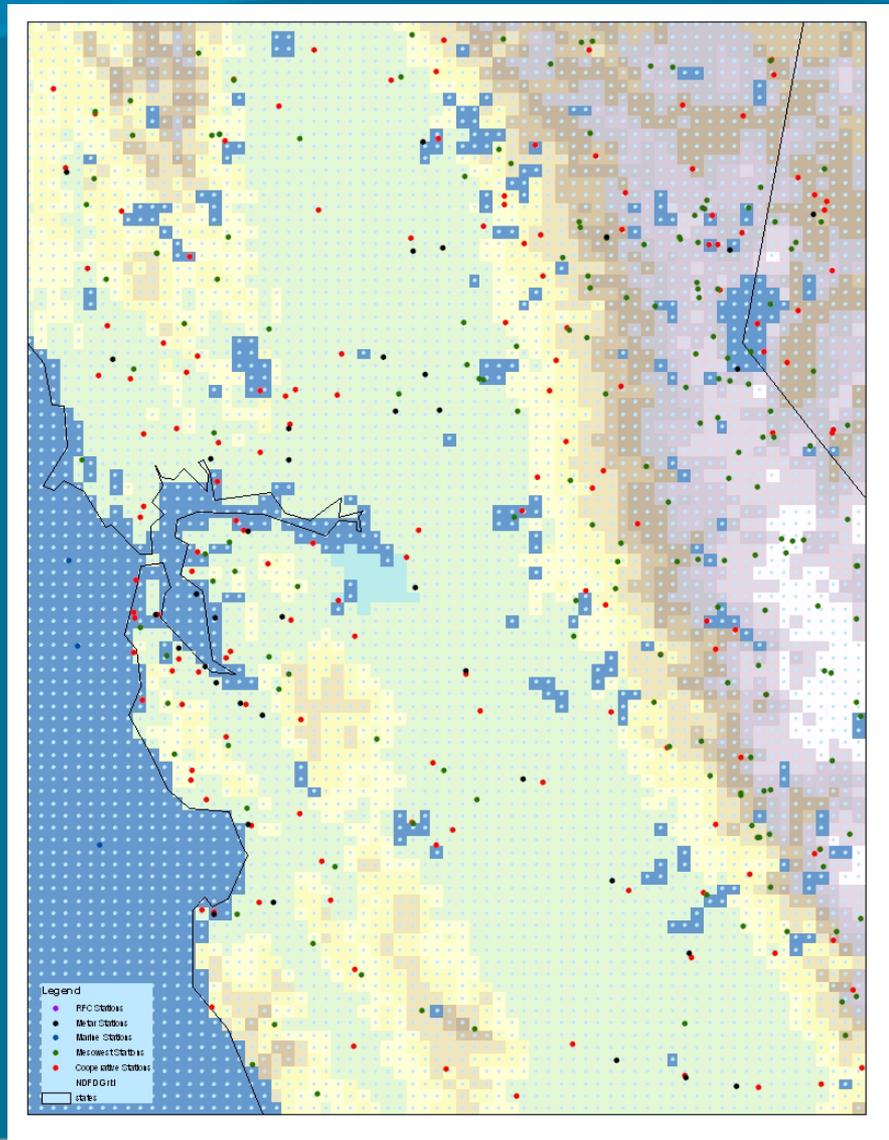
# High Resolution MOS



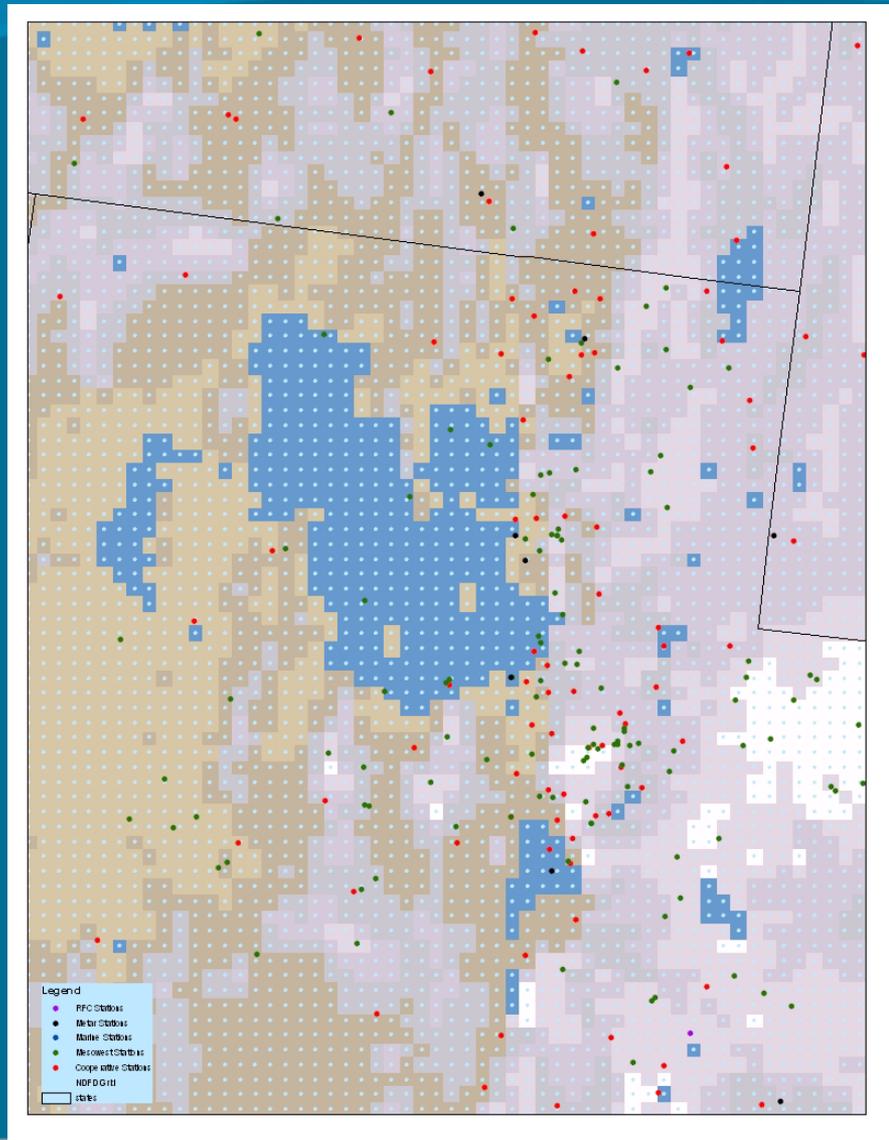
# Western Gridded MOS Tile



# San Francisco Bay Area

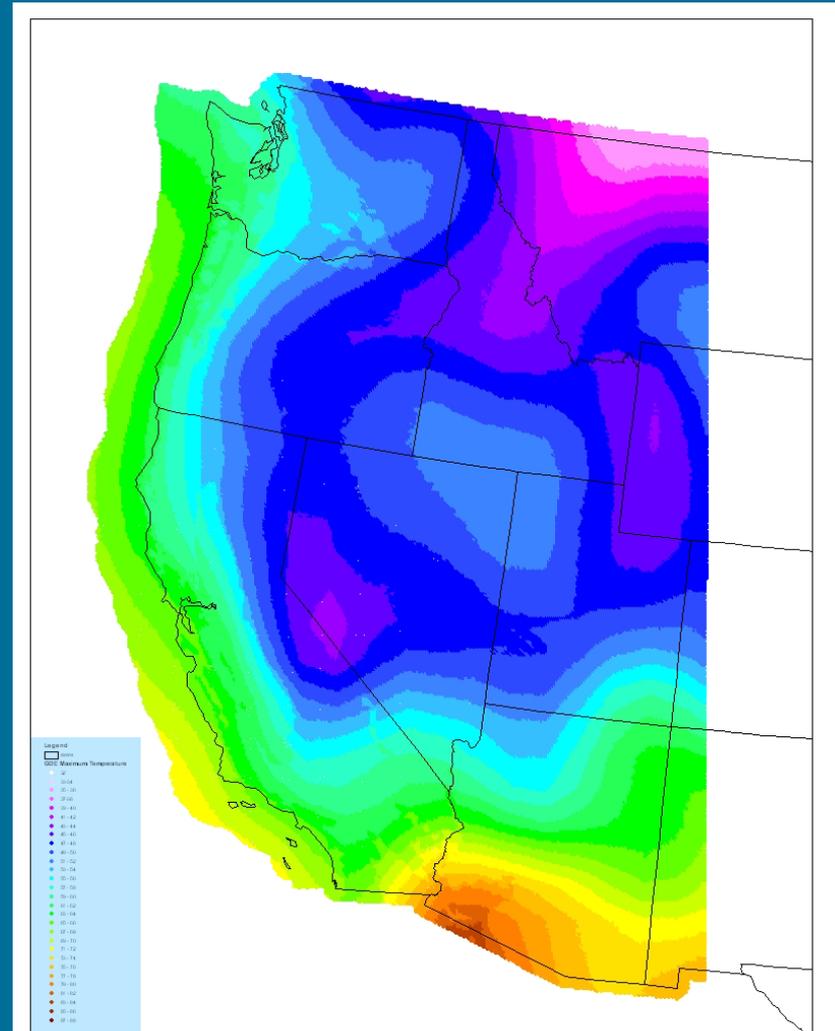


# Salt Lake City Area



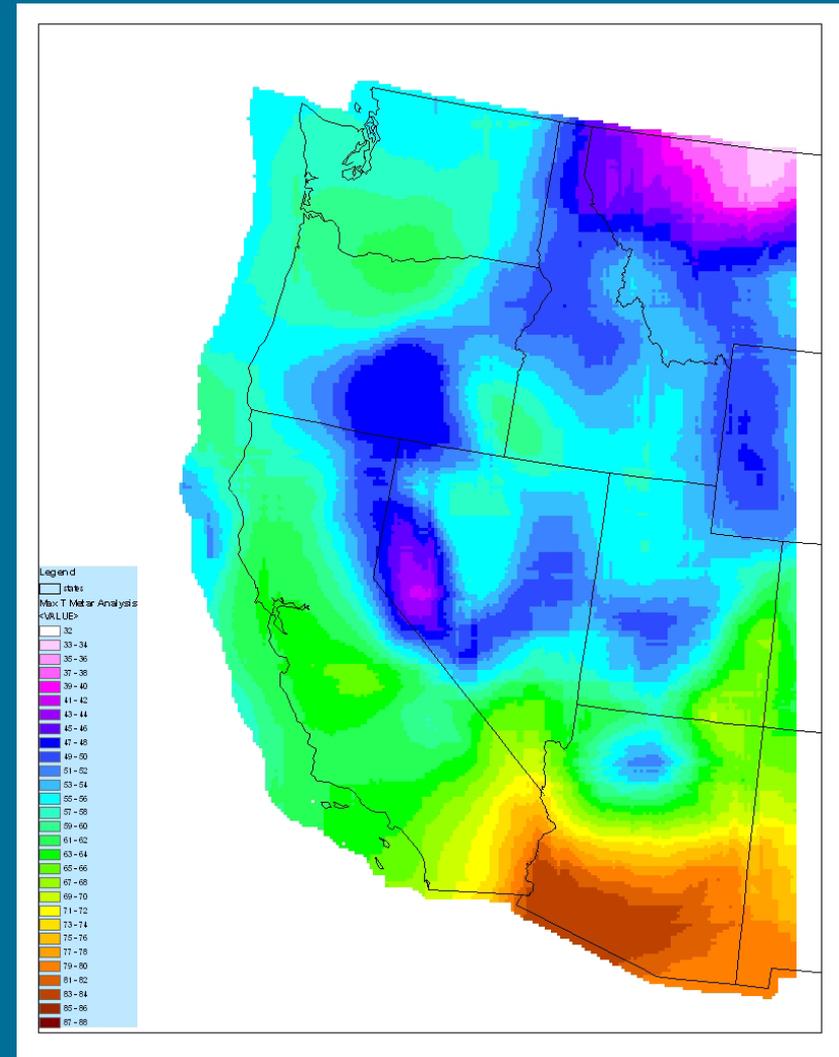
# Gridded MOS Max Temp

- First Guess
- Day 1 Max, valid 10/20/04
- Regionalized operator equation



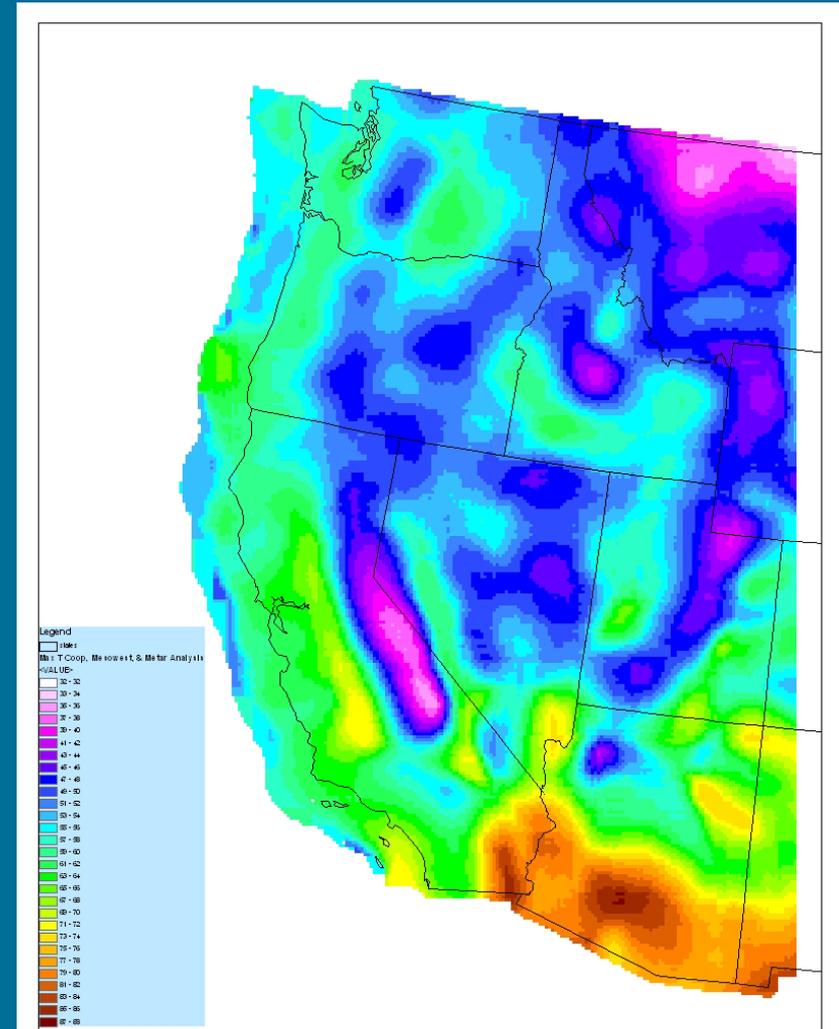
# Gridded MOS Max Temp Analysis

- Analysis
- Day 1 Max, valid 10/20/04
- Guidance at METAR sites only



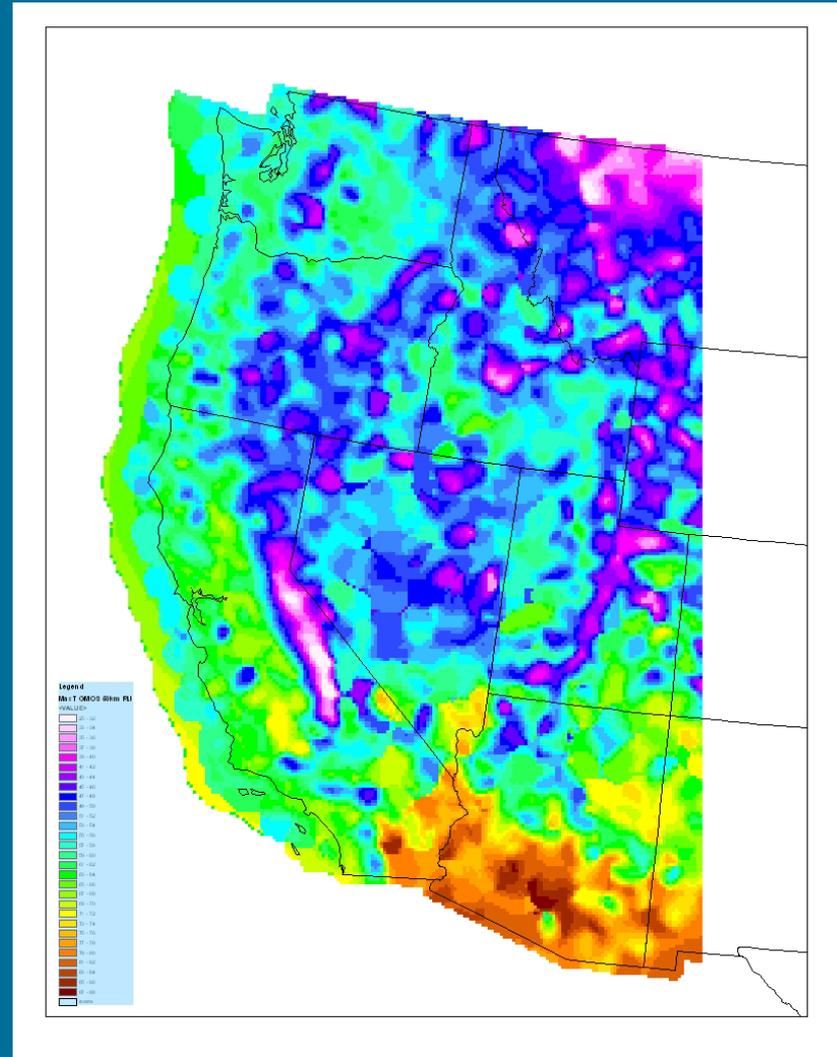
# Gridded MOS Max Temp Analysis

- Analysis
- Day 1 Max, valid 10/20/04
- Guidance at all available sites
- Blending not tuned yet



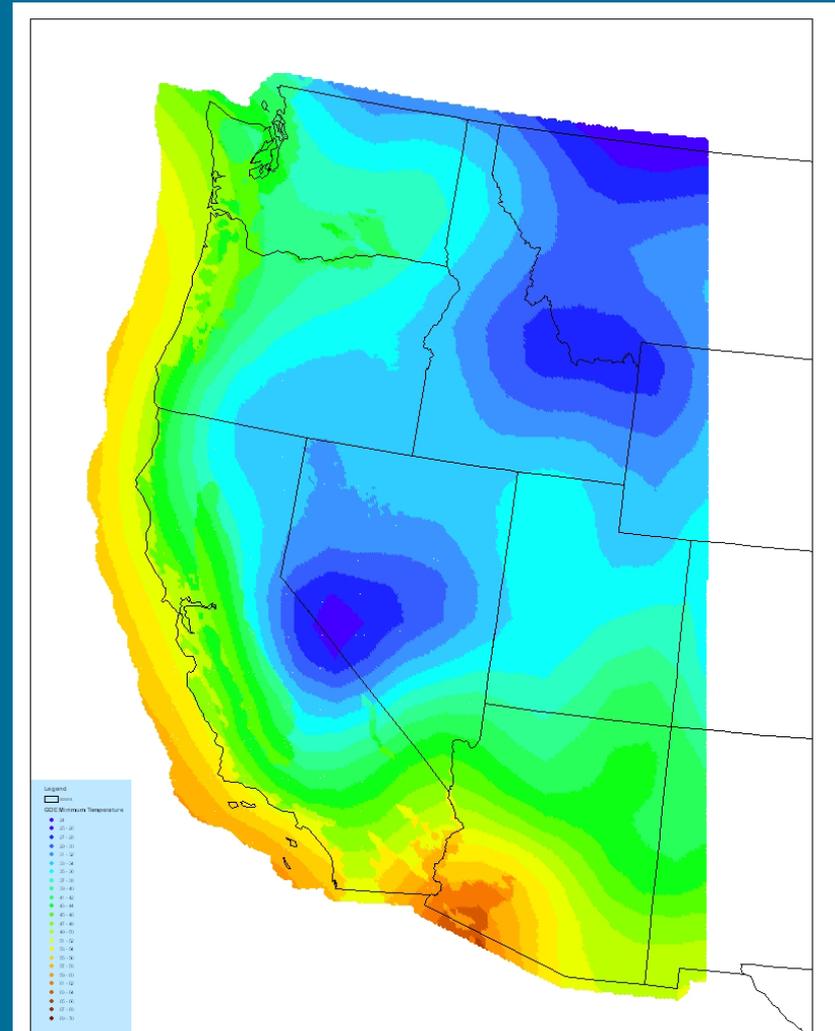
# Gridded MOS Max Temp Analysis

- Analysis
- Day 1 Max, valid 10/20/04
- Guidance at all available sites only
- Some tuning of analysis



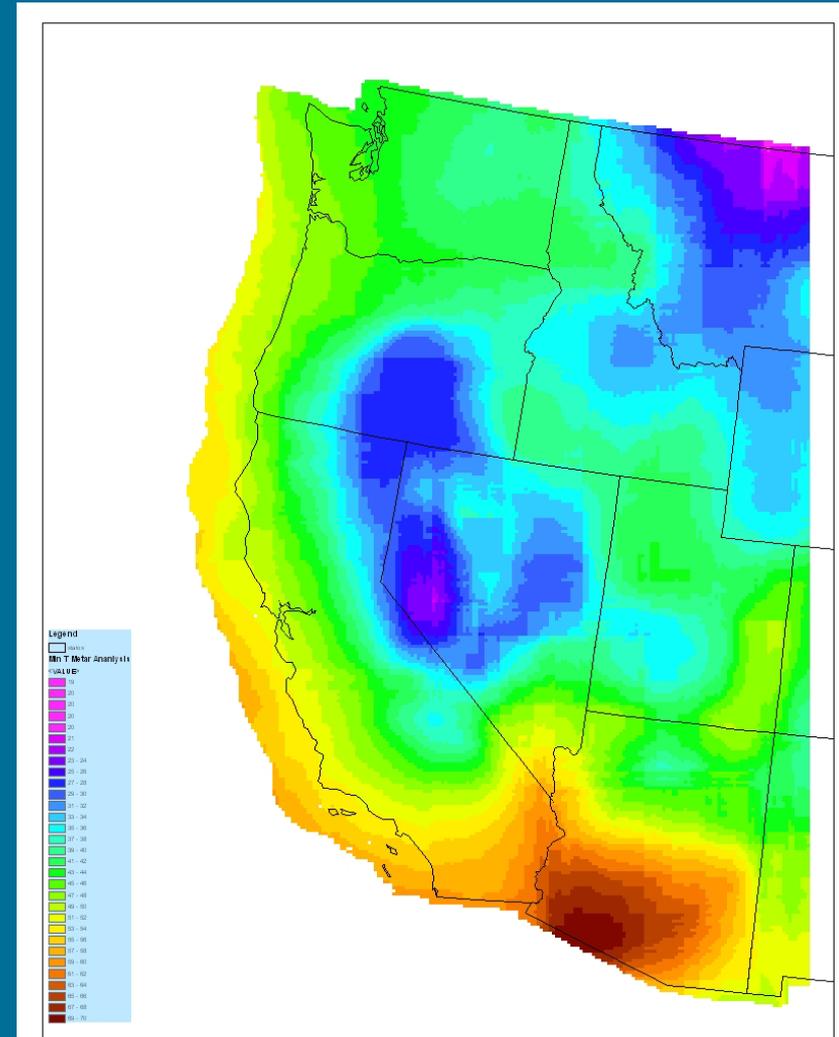
# Gridded MOS Min Temp

- First Guess
- Day 2 Min, valid 10/21/04
- Regionalized operator equation



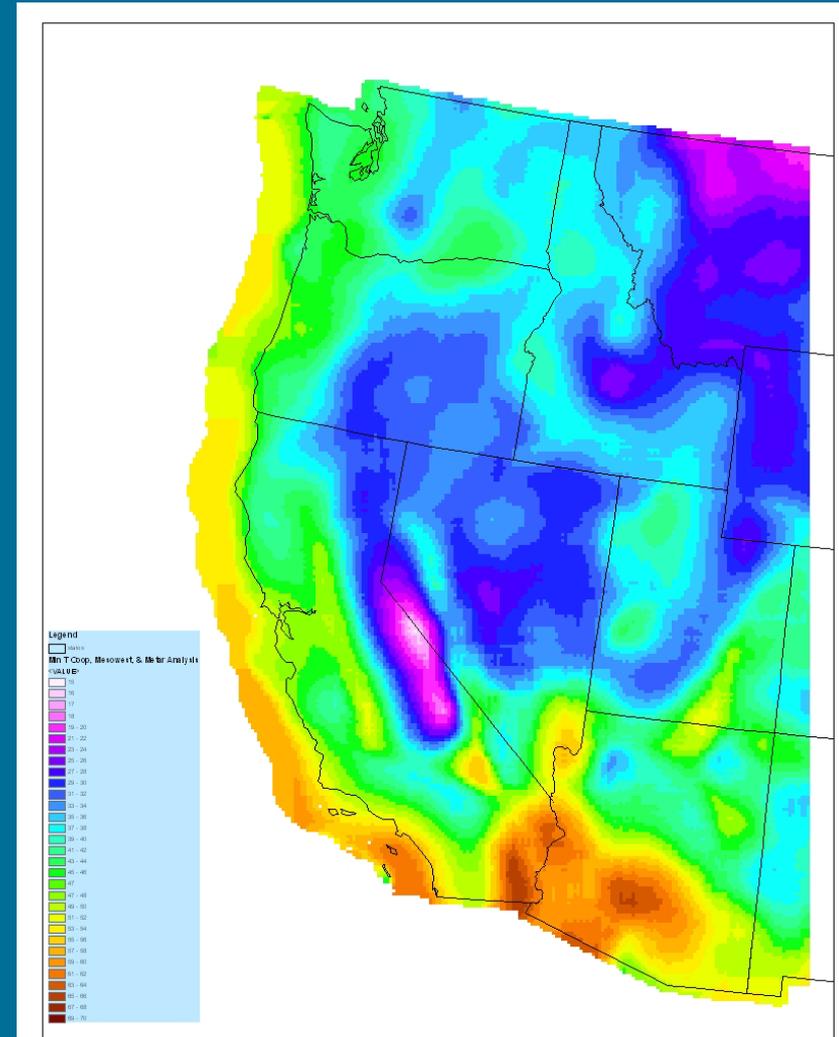
# Gridded MOS Min Temp Analysis

- Analysis
- Day 2 Min, valid 10/21/04
- Guidance at METAR sites only

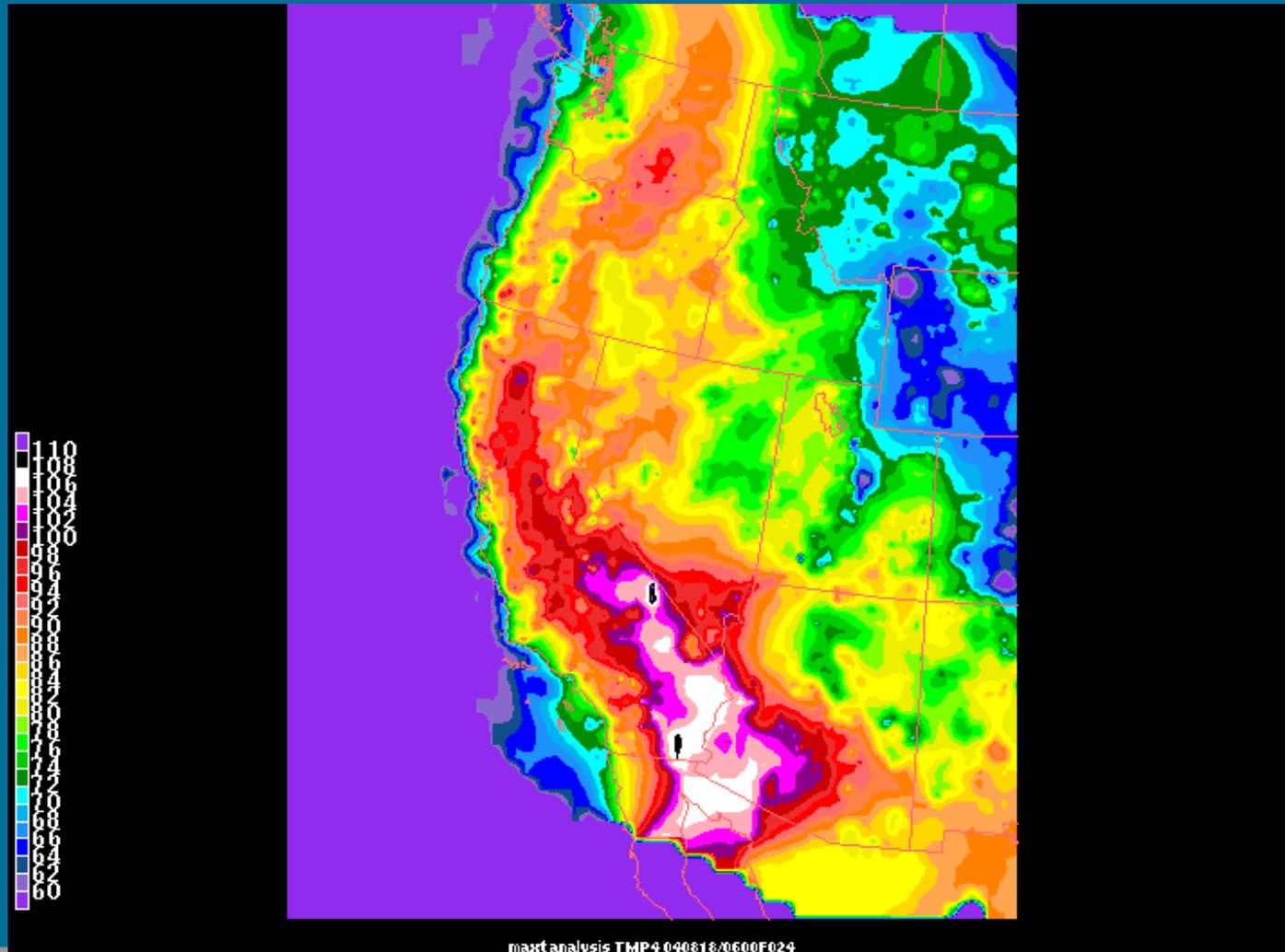


# Gridded MOS Min Temp Analysis

- Analysis
- Day 2 Min, valid 10/20/04
- Guidance at all available sites
- Blending not tuned yet



# Gridded MOS Day 1 Max, valid 8/17/04

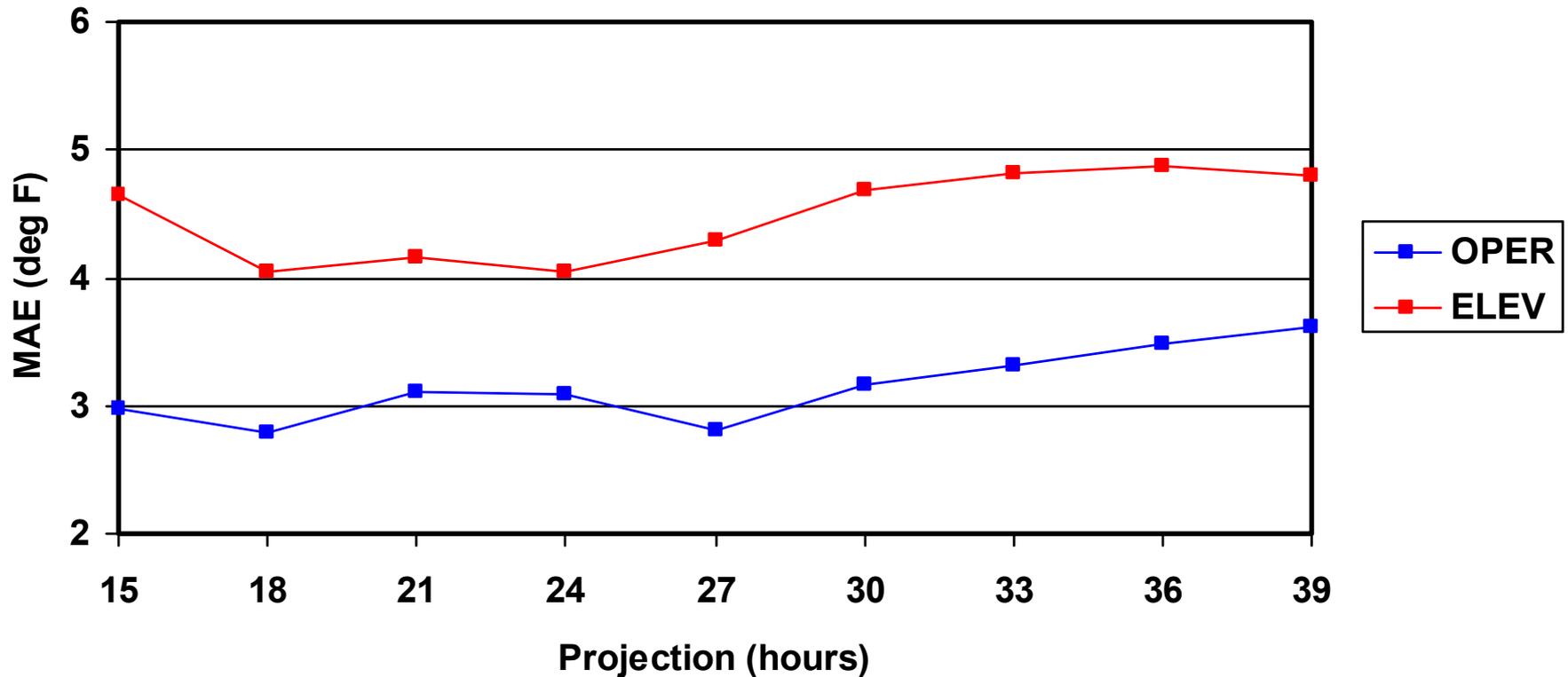


# Conclusions

- **Need geoclimatic data**
- **Need to be wary of mesonet observations**
- **Need to solve computational time issues**
- **Need to answer more questions**
  - **Is 1<sup>st</sup> guess adequate?**
  - **Will our probabilities satisfy what we want?**
  - **Will forecasters forego the single station guidance?**
  - **Will these products provide adequate initialization for forecaster grids?**

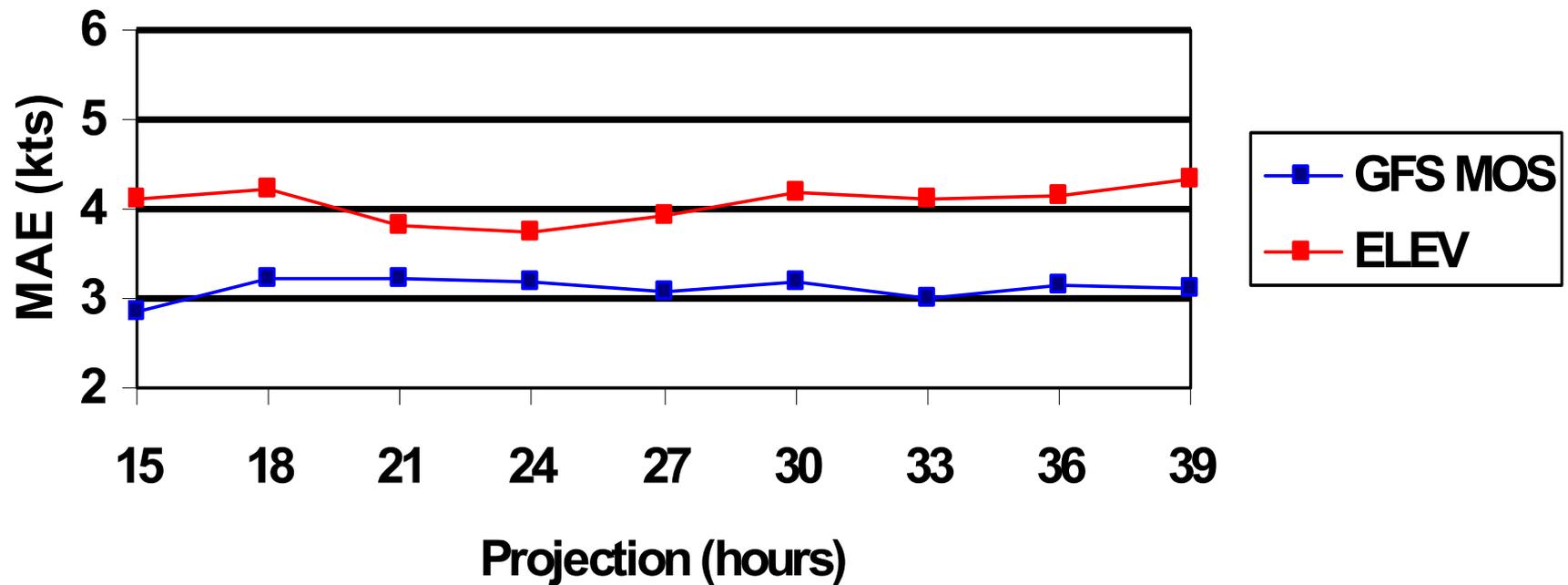
# Accuracy of Regional Temperature Equations

Temperature MAE - Oct '03 - Feb '04  
21 Stations - Western U. S.

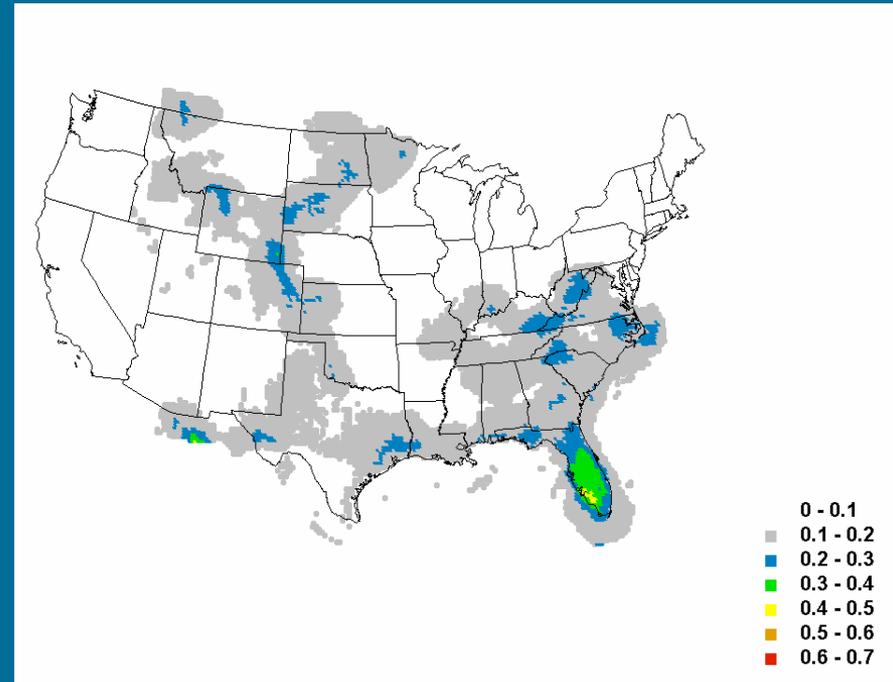
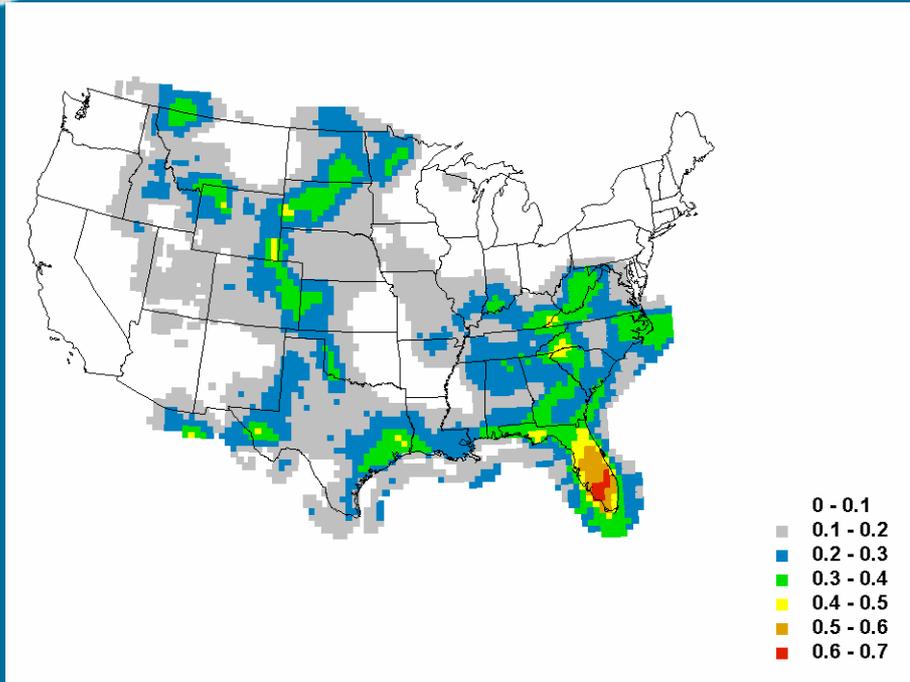


# Accuracy of Regional Wind Speed Equations

Wind Speed MAE - Oct '03 - Feb '04  
21 Stations - Western US



# 3H Eta MOS probability forecasts ending at 0000 UTC on August 27, 2002



40-km 21-24h period  
10% contour interval

20-km 21-24h period  
10% contour interval

# Guidance for Co-op Sites

GFSX-BASED MOS COOP MAX/MIN GUIDANCE 11/13/04 0000 UTC															
	SAT 13	SUN 14	MON 15	TUE 16	WED 17	THU 18	FRI 19	SAT 20							
ABNA1	64	44 61	38 61	38 67	44 69	44 70	46 67	46 65							
...															
ANNM2	54	31 53	34 59	38 62	36 55	38 61	41 61	36 57							
BERM2	54	35 54	40 59	43 58	44 57	44 60	46 60	44 57							
BTVM2	47	30 49	32 58	35 58	35 55	37 58	39 59	37 55							
CBLM2	48	26 52	31 57	30 60	34 57	36 57	33 58	32 54							
CHEM2	45	28 50	33 59	33 58	33 54	35 58	36 57	34 55							
CNWM2	51	30 53	32 58	37 60	35 55	37 60	39 59	35 58							
DMAM2	44	25 45	32 52	34 56	36 52	35 54	37 55	36 51							
ELCM2	47	23 49	27 56	30 59	31 55	32 57	33 59	32 55							
EMM2	46	26 50	30 57	33 60	34 52	36 58	37 58	33 57							
FREM2	46	32 52	34 57	37 62	36 54	39 59	39 60	38 55							
FRSM2	38	21 42	28 50	32 53	34 47	33 50	35 49	34 45							
GLDM2	44	27 48	29 58	33 61	32 54	35 57	36 58	32 53							
HAGM2	47	28 50	31 58	34 59	34 57	37 59	38 59	35 58							
KAPG	47	31 50	36 57	39 58	36 53	39 57	40 59	36 55							
LRLM2	48	31 50	36 58	39 60	38 54	39 58	42 61	40 54							
MECM2	48	28 45	32 56	37 57	35 54	38 59	39 58	36 55							
MLLM2	46	29 48	33 55	34 58	35 52	36 55	38 55	36 52							
NARD2	48	31 52	33 59	34 60	37 58	37 61	38 62	36 56							
OLDM2	47	21 49	24 52	29 57	29 54	32 55	32 55	29 49							